

PATENT

Applicant:	SILENIUS	Serial No.:	TO BE ASSIGNED
Filed:	AUGUST 5, 2002	Docket No.:	602.173USC1
Title:	NOIL FOR USE IN PAPER MANUFACTURE, METHOD FOR ITS PRODUCTION, AND PAPER PULP AND PAPER CONTAINING SUCH NOIL		

Name:

Kindly rewrite the paragraph starting at page1, line 4 as:

The present invention relates to noil for use in paper manufacture. Moreover, the invention relates to a method for producing such noil and to paper pule and paper containing the noil.

Please add the titles to the various sections of the application as follows:

Before the paragraph starting at page 1, line 4, add the title:

Field of the Invention

Before the paragraph starting at page 1, line 9, add the title:

Background of the Invention

Before the paragraph starting at page 2, line 22, add the title:

Summary of the Invention

Before the paragraph starting at page 6, line 1, add the title:

Brief Description of the Drawings

Before the paragraph starting at page 6, line 14, add the title:

Detailed Description

IN THE CLAIMS

A clean copy of the new and amended claims is included below. A marked up copy of the entire set of claims is included in Appendix A.

Please amend claims 1-16 as follows.

1. (Once Amended) Noil for use in paper manufacture, said noil being mixed in paper pulp, characterised in that the noil has been produced from cellulose fibre by refining and consists of noil fibrils which, in respect of in size distribution, substantially

correspond to wire screen fraction P50, and that the noil constitutes 0.1 –15 w-% of the paper pulp.

2. (Once Amended) Noil as defined in claim 1, characterised in that the noil fibrils substantially correspond to wire screen fraction P100.

3. (Once Amended) Noil as defined in claim 1, characterised in that the paper pulp contains pigment, the mass ratio of pigment to noil being 0.1 – 20.

4. (Once Amended) Noil as defined in claim 1 [any one of claims 1-3], characterised in that the noil has been produced by refining cellulose fibre to a Schopper-Riegler number [$>$] greater than 80.

5. (Once Amended) Noil as defined in claim 4, characterised in that cellulose fibre has been refined to a Schopper-Riegler number in the range 85 – 90.

6. (Once Amended) Method for producing noil for use in paper manufacture, characterised in that cellulose fibre is refined so as to form noil fibrils that, in respect of size distribution, substantially correspond to wire screen fraction P50.

7. (Once Amended) Method as defined in claim 6, characterised in that the noil fibrils substantially correspond to wire screen fraction P100.

8. (Once Amended) Method as defined in claim 6, characterised in that the noil is produced by refining cellulose fibre to a Schopper-Riegler number greater than 80.

9. (Once Amended) Method as defined in claim 8, characterised in that cellulose fibre and/or mechanical pulp fibre is/are refined to a Schopper-Riegler number in the range 85 – 90.

10. (Once Amended) Paper pulp for use in paper manufacture, containing cellulose fibre and/or mechanical pulp fibre, and filler, characterised in that the paper pulp contains noil that has been produced from cellulose fibre by refining and consists of noil fibrils substantially corresponding in size distribution to wire screen fraction P50 and that the noil constitutes 0.1 – 15 w-% of the paper pulp.

11. (Once Amended) Paper pulp as defined in claim 10, characterised in that the noil fibrils [mainly] substantially correspond to wire screen fraction P100.

12. (Once Amended) Paper pulp as defined in claim 10, characterised in that the paper pulp contains pigment, the mass ratio of pigment to noil being 0.1 – 20.

13. (Once Amended) Paper pulp as defined in claim 10, characterised in that the noil has been produced by refining cellulose fibre to a Schopper-Riegler number greater than 80.

14. (Once Amended) Paper pulp as defined in claim 11, characterised in that cellulose fibre has been refined to a Schopper-Rielger number in the range 85 – 90.

15. (Once amended) Paper manufactured using noil as defined in claim 1.

16. (Once Amended) Paper manufactured using paper pulp as defined in claim 10.

Kindly add the following new claims.

17. (new) Noil as defined in claim 1, wherein the noil fibrils are in a non-gel form.

18. (new) Method as defined in claim 6, wherein the cellulose fibre is refined in non-gel form.

19. (new) Paper pulp as defined in claim 10, wherein the noil fibrils are in non-gel form.

REMARKS

Claims 1-19 are pending in the patent application. Claims 1-16 have been amended. New claims 17-19 have been added. No new matter has been added.

Claims 3, 4, 8, 12 and 13 have been amended to remove multiple dependence.

Claims 4, 5, 8, 9, 13 and 14 were objected to for containing a mathematical symbol and for incorrectly referring to the Schopper number. The mathematical symbols have been replaced by the words "greater than." Furthermore, the Examiner required that the Schopper number be referred to as the "Schopper-Riegler" number and that the units be presented in degrees. Applicant respectfully asserts that the term Schopper-Riegler number is adequate for one of ordinary skill in the art to understand. For example, the enclosed copy of the Schopper-Riegler standard (Published by the Scandanavian Pulp, Paper and Borad, Testing Committee, 1964) refers, in the definition section, to the "Schopper-Riegler (SR) number". Accordingly, since it is accepted practice to use the term Schopper-Riegler number, this term has been left in the claims. It is believed that these changes to claims 4, 5, 8, 9, 13 and 14 do not affect the scope of these claims.

Claims 1-16 are rejected under 35 U.S.C. § 112, second paragraph for being vague and indefinite. In particular, the Examiner objected to the use of the word "mainly". This has been removed and replaced with the term "substantially", which is believed to be clear and definite, according to MPEP § 2173.05(b).

It is stated in the Office Action that claims 1-7 and 10-11 are indefinite because the terms P50 and P100 do not define the sieve screen used. Applicants respectfully assert that the claim language is not indefinite. The terms P50 and P100 refer to

material that is passed through a 50 mesh and a 100 mesh screen respectively. Accordingly, the terms P50 and P100 are not indefinite.

It was stated in the Office Action that claim 10 was indefinite because it did not indicate what other noils were employed. The phrase "if desired, other kinds of noil" was used to indicate that the paper pulp of claim 10, while necessarily having the type of noil that is the subject matter of the claim, may also include other types of noil. This phrase has been deleted, to remove any indefiniteness. Applicant notes that claim 10 is written in open form, and respectfully asserts that the amended form of claim 10 has not been narrowed by the amendment, and that the paper pulp of the type claimed in claim 10 may also include other types of noil.

It is stated in the Office Action that claims 15 and 16 are indefinite since the steps of using the noils have not been recited. Applicant respectfully contends that no method steps need be recited. Claim 15 is a product claim and is directed to paper formed using the noil as defined in claim 1. Claim 16 is a product claim and is directed to paper formed using the paper pulp as defined in claim 10. Since the paper of claim 15 is uniquely defined by the noil of claim 1 and the paper of claim 16 is uniquely defined by the pulp of claim 10, there is no need to recite method steps.

It is believed that all claims comply with 35 U.S.C. § 112, second paragraph.

Claims 1-16 are rejected under 35 U.S.C. § 103(a) as being unpatentable over either Gavelin (U.S. Patent No. 4,889,594) or Roberts (U.S. Patent No. 4,692,211).

Gavelin teaches a method of manufacturing filler containing papers in which filler and refined fine pulp are mixed and then added to the pulp. The retention and technical properties of the paper are enhanced by coflocculating the filler with fine pulp which contains a high proportion of fine fraction (which passes through 150 mesh Bauer McNett screen) with the aid of retention agents. The best results, from the forming and retention aspect, are obtained by subjecting the flocs generated to a size-controlling shearing process in which large flocs (4-7mm) are broken down and small flocs are (around 2mm, for example, 0.1-1 mm) are agglomerated. A suitable floc size is 2.5-3.6 mm.

Roberts teaches high strength cellulosic paper in which a refined kraft papermaking pulp is mixed with hydrated cellulosic gel.

The invention of claim 1 is directed to a noil for use in paper manufacture, where the is mixed in paper pulp. The noil is produced cellulose fibre by refining and consists of noil fibrils which, in respect of in size distribution, substantially correspond to a wire screen fraction P50. The noil constitutes 0.1 –15 w-% of the paper pulp.

The invention of claim 6 is directed to a method for producing noil for use in paper manufacture. According to the method, the cellulose fibre is refined so as to form noil fibrils that, in respect of size distribution, substantially correspond to wire screen fraction P50.

The invention of claim 10 is directed to paper pulp for use in paper manufacture, containing cellulose fibre and/or mechanical pulp fibre, and filler. The paper pulp contains noil that has been produced from cellulose fibre by refining and consists of noil fibrils substantially corresponding in size distribution to wire screen fraction P50 and that the noil constitutes 0.1 – 15 w-% of the paper pulp.

Three criteria must be met to establish a *prima facie* case of obviousness. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference. Second, there must be a reasonable expectation of success. Finally, the prior art reference, or combination of references, must teach or suggest all the claim limitations. MPEP § 2142. Applicant respectfully traverses the rejection since the prior art fails to disclose all the claim limitations and there would be no motivation to modify the references as proposed by the Examiner.

It is useful first to discuss the meanings of various terms used in this response. The term "40-100 ml CFS" means in Schopper-Riegler (SR) scale a Schopper-Riegler number between 70-85. Copies of CFS and SR standards (published by the Scandanavian Pulp, Paper and Board Testing Committee, 1964 and 1965) are enclosed with this response, along with a copy of a conversion curve for converting between CFS and SR units.

50/100/150 mesh Bauer McNett means 50/100/150 mesh wire screen. The term "P" in front of the wire screen size means "passed" and "R" means "rejected". Thus P50 indicates material that is passed by the 50 mesh Bauer McNett screen. It is difficult to convert Bauer McNett values directly into SR or CFS values because the values are

dependent on various factors, such as the ion content of the water used in the measurements.

The present invention differs from the Gavelin's method in the size distribution used. All the fractions and floc sizes mentioned by Gavelin would be retained in the Bauer McNett P50 wire screen, rather than passed through the screen. The Office Action admits that Gavelin's particles between 0.5-1 mm, described at col. 3, lines 43-66, would be retained by a 50 mesh screen, rather than passed by the screen. Thus, Gravelin does not teach or suggest the elements of the invention as claimed in the Office Action, and the use of P50 material would not result simply from a simple optimization process of Gravelin's teaching.

An advantage of the present invention is that the noil can be mixed in the paper pulp, i.e. without coflocculating the pigment and noil and subjecting the flocs to a floc size-controlling shearing process. Another advantage of the present invention is that there is no need for retention agents when binding the pigment to noil fibrils: the character of the fibrils is such that pigments and fibrils are "entangled" together without retention agents. Thus the paper according to the invention easier and cheaper to manufacture.

To further indicate the differences between Gravelin's method and the present invention, It is useful to consider the differences between the papers produced according to the present invention and that produced using Gavelin's method. According to Gavelin's example 1, Gavelin's method improves the tensile index from 26.4 to 37.2 kNm/kg, corresponding to an increase in the tensile index of only about 41 %. The method according to the present invention, on the other hand, improves the tensile index from 25 to 40 kNm/kg, corresponding to an increase of 60 %. Simultaneously the presently claimed paper increases the light-scattering coefficient from 58 to 63 m²/kg, corresponding to an increase of 9%. Gavelin reports no increase in the brightness of the paper. Thus, use of the present invention results in a paper having improved strength and optical properties, while Gavelin's method improves only the strength. Accordingly, Applicant contends that it would not be obvious to modify Gravelin in the manner proposed in the Office Action, to achieve the results of the

claimed invention. Thus, claims 1-16 are not obvious in view of Gavelin and are allowable.

Roberts fails to disclose the size distribution of noil fibrils in sellulosic gel. The aim of Robert's method is to improve the strength properties of kraft paper; improved optic properties are not disclosed. Applicant respectfully asserts that it would not be obvious that a paper with both improved strength and improved brightness would be obtained from using P50 material as claimed, and that such improvement in these two different paper properties is unexpected.

New claims 17-19 are directed to the noil fibrils being in non-gel form. For example, the method of manufacturing the noil fibrils presented on page 6, lines 15-34 produces non-gel noil fibrils.

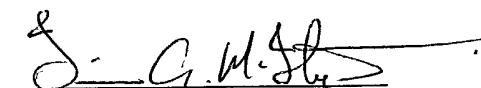
In view of the amendments and reasons provided above, it is believed that all pending claims are in condition for allowance. Applicant respectfully requests favorable reconsideration and early allowance of all pending claims.

If a telephone conference would be helpful in resolving any issues concerning this communication, please contact the below-signed attorney, Iain A. McIntyre at 952.253.4110.

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Appendix A
Marked Up Version of the Entire Claim Set

1. (Once Amended) Noil for use in paper manufacture, said noil being mixed in paper pulp, characterised in that the noil has been produced from cellulose fibre by refining and consists of noil fibrils which, in respect of in size distribution, [mainly] substantially correspond to wire screen fraction P50, and that the noil constitutes 0.1 – 15 w-% of the paper pulp.

2. (Once Amended) Noil as defined in claim 1, characterised in that the noil fibrils [mainly] substantially correspond to wire screen fraction P100.

3. (Once Amended) Noil as defined in claim 1 [or 2], characterised in that the paper pulp contains pigment, the mass ratio of pigment to noil being 0.1 – 20.

4. (Once Amended) Noil as defined in claim 1 [any one of claims 1-3], characterised in that the noil has been produced by refining cellulose fibre to a Schopper-Riegler number [$>$] greater than 80.

5. (Once Amended) Noil as defined in claim 4, characterised in that cellulose fibre has been refined to a Schopper-Riegler number in the range 85 – 90.

6. (Once Amended) Method for producing noil for use in paper manufacture, characterised in that cellulose fibre is refined so as to form noil fibrils that, in respect of size distribution, [mainly] substantially correspond to wire screen fraction P50.

7. (Once Amended) Method as defined in claim 6, characterised in that the noil fibrils [mainly] substantially correspond to wire screen fraction P100.

8. (Once Amended) Method as defined in claim 6 [or 7], characterised in that the noil is produced by refining cellulose fibre to a Schopper-Riegler number [$>$] greater than 80.

9. (Once Amended) Method as defined in claim 8, characterised in that cellulose fibre and/or mechanical pulp fibre is/are refined to a Schopper-Riegler number in the range 85 – 90.

10. (Once Amended) Paper pulp for use in paper manufacture, containing cellulose fibre and/or mechanical pulp fibre, and filler [and, if desired, other kinds of noil], characterised in that the paper pulp contains noil that has been produced from cellulose fibre by refining and consists of noil fibrils [mainly] substantially corresponding in size distribution to wire screen fraction P50 and that the noil constitutes 0.1 – 15 w-% of the paper pulp.

11. (Once Amended) Paper pulp as defined in claim 10, characterised in that the noil fibrils [mainly] substantially correspond to wire screen fraction P100.

12. (Once Amended) Paper pulp as defined in claim 10 [or 11], characterised in that the paper pulp contains pigment, the mass ratio of pigment to noil being 0.1 – 20.

13. (Once Amended) Paper pulp as defined in claim 10 [any one of claims 10-12], characterised in that the noil has been produced by refining cellulose fibre to a Schopper-Riegler number [$>$] greater than 80.

14. (Once Amended) Paper pulp as defined in claim 11, characterised in that cellulose fibre has been refined to a Schopper-Rielger number in the range 85 – 90.

15. (Once amended) Paper manufactured using noil as defined in claim 1 [any one of claims 1-5].

16. (Once Amended) Paper manufactured using paper pulp as defined in claim 10 [any one of claims 10-14].

17. (new) Noil as defined in claim 1, wherein the noil fibrils are in a non-gel form.

18. (new) Method as defined in claim 6, wherein the cellulose fibre is refined in non-gel form.

19. (new) Paper pulp as defined in claim 10, wherein the noil fibrils are in non-gel form.

Appendix B
Marked Up Version of the Amended Paragraphs of the Specification

The changes to the paragraph starting at page1, line 4 are as follows:

The present invention relates to noil for use in paper manufacture[, as defined in the preamble of claim 1]. Moreover, the invention relates to a method for producing such noil and to paper pule and paper containing the noil [it].